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ABSTRACT

Through interactive-observation, the strengths of the video recorder (actual viewing experience) and the strengths of the computer (capability for feedback, record keeping, and problem analysis) can be combined and used in the preparation of personnel to educate handicapped children and youth. In the area of communicative disorders, accurate videotape portrayals of speech-language and hearing problems could readily be transported from special rehabilitative sites to training facilites to familiarize educational personnel with the nature of a given disability and strategies for classroom management. In interactive-observation, a computer is connected through special hardware and software to a video player, and the computer controls the tape presented by the video system depending on the viewer's responses to the lesson programmed into the computer. Benefits of interactive-observation to the trainees include: more available information; rapid access to information; individualized instruction; increased motivation; increased attention span; and more immediate feedback. Benefits to the training institution include: more efficient inservicing; uniformity of information; better organization and control of training information; and a greater capacity to provide information to trainees and teachers. This paper describes this innovative teaching system, and includes some basic information on the type and cost of equipment (both hardware and software) necessary to run an interactive-observation learning center. (CB)

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Interactive-Observation In Communicative Disorders

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EC 191355

INTERACTIVE - OBSERVATION

IN

COMMUNICATIVE DISORDERS

Presented by

Hall, Harris, Secor and Rolls

Interactive-observation is a new and powerful teaching system which combines the strengths of computer assisted instruction with the graphic realism of television.

Recent advances in the technology of video systems and computer software have presented new opportunities for research into innovative approaches to personnel preparation and the development of materials to prepare personnel to educate handicapped children and youth. In reference to video systems, Thomas and Thomas (1984, p. 28) have concluded that presently, "The most efficient medium for presenting massive amounts of information and examples is videotape." Kaufman and Kaufman (1983) have reported that video instruction is very effective in training medical students, especially in the areas of neurology and psychiatry because it allows the students to actually view patients who have the disorders they are studying. Hence, video instruction improves the quality of education by effectively bringing to students concrete examples of theoretical concepts heretofore inaccessible to them under the typical classroom lecture paradigm. This has particular relevance to the training of personnel associated with the education of handicapped children. In the area of communicative disorders, for example, accurate videotape portrayals of speech-language and hearing problems could readily be transported from special rehabilitative sites to training facilities to familiarize educational personnel with the nature of the disability and strategies for classroom and home management. This enriched curriculum can be accomplished, moreover, without an increase in the amount of time the teacher must spend in instruction.

One major disadvantage of the video recorder, however, is the linear nature of the presentation. An interactive paradigm with horizontal as well as vertical lesson flow is known to be far more effective in teaching. Another major drawback is the passivity or lack of involvement of the students during the viewing process. Experience obtained through the observation program in the Department of Communicative Disorders at CSUN, for example, suggests that without the elements of commitment and feedback, the observers often become careless and inattentive. The lessons are, in addition, inefficient in terms of record keeping, providing written instructions, administering examinations, or giving ready reference to problem areas.

The computer, on the other hand, excels in promoting the elements of commitment and feedback and can easily provide for written instructions, examinations, record keeping and problem analysis. Like the video system, it requires less personal involvement of the instructor as the trainees can individually run their own lessons. Commitment occurs because the student is required to make numerous decisions during the course of the lesson, and the correctness of these decisions is immediately available to the student. Problem diagnosis and assistance is provided by the computer as needed to guide the student toward the proper solutions. The student's progress is automatically recorded on computer diskettes, and computer programs are available for the statistical analysis of this lesson drill and record keeping.

A negative factor restricting the effectiveness of computers as an instructional aid in the areas of speech, language, and audiology, however, is their limited graphic capability to portray language or rehabilitative techniques with any realism. Objects and events can be

depicted only in rigid schematic form at considerable cost to the computer's memory reserve. The quality of the audio components, particularly voice, is even more unsuited to the instruction of trainees in specialized fields or of nurses, teachers, administrators or parents from the general education milieu attempting to understand technical information in a special field.

The innovative course of action would be to combine the strengths of the two teaching aids, the video recorder and the computer, to achieve both a realism in the graphics and the involvement of the student. Recent technological advances have now made this feasible. The combined system is referred to as computer assisted video (CAV), interactive video, or as it is called here, Interactive-observation. A computer is connected through special hard- and software to a video player. Hence, the computer controls the tape presented by the video system depending upon the responses of the viewer to the lesson programmed into the computer. It provides immediate feedback, intervention and record keeping services as needed. Dillingham, Roe & Roe (1982) have noted that "Computer assisted video instruction can provide both language (printed on the video screen) image (objects or action recorded on videotape) and the interaction of stimuli (questions on the screen) and response (student inputted answers)" (p. 657). Thus, Interactive-observation, although it is still in the developmental stages, has become a surging educational force in almost all fields including the military, health services, business, industry, and some areas of education (Reilly, 1985). In this training milieu, computers have been aligned with both videotape and/or videodisc recorders. The former is less expensive and readily available to

any educational institution. It requires only a computer with a disc drive (e.g. Apple IIe), an interface module, dual audio track videotape recorder, and a video monitor. Its disadvantages, however, include slow information access time, and wear and tear on the active process. They are more durable and have better image clarity. The most important aspect, however, is rapid research time, allowing information to be accessed from anywhere on the disc within seconds." (Reilly, 1985). A major disadvantage has been high initial disc development costs and processing complications. Depending on the premastering costs and content, a 30-minute disc could cost $40,000 and could only be processed by a few special companies. Recent technological advances have drastically reduced this cost with the advent of the "home" disc recorder (developed by Panasonic). Hence, both initial and duplicating costs of video discs are suddenly coming into the range of feasibility for widespread use in the domain of special education.

As computer power becomes available at more affordable prices, it invites careful research as a clinical tool (Fitch, 1985). With the advent of this innovative marriage between the video and microcomputer the basic need becomes one of developing and evaluating an Interactive-observation system in the training of personnel to habilitate communicatively handicapped children.

Advantage of Interactive Video

As computers have invaded the National Educational scene and paved the way for interactive machine teaching, the potential for Interactive-observation to have an impact is equally as great. The National Center of Educational Statistics in the U.S. Department of

Education reported that in 1982, one in three public schools had computer facilities, and by 1985 the number of computers in the schools was estimated to have doubled (Aeppel, 1983). Locally in the Los Angeles Unified School District, according to the Superintendent's Office, there are nearly 2,500 minicomputers in use for staff development and instruction. If Interactive-observation Learning Centers are demonstrated to be effective and feasible, they may be the next inexpensive step toward achieving new levels of excellency in teacher inservicing and preparation.

Interactive-observation Learning Centers would benefit education at all levels from the individual being trained to the training institutions themselves in the following ways:

Benefits to the Trainees:

More Information Available: Interactive video provides a powerful information tool. A standard 12 inch disc contains 54,000 single frames per side enabling large quantities of data to be manipulated (Reilly, 1985).

Rapid Access to Information: Trainees would no longer need to be constrained by rigid class schedules but could access Interactive-observation Learning Centers at their convenience, and consequently at their optimum learning periods. In addition, information which is not typically available in the classroom (e.g. taped demonstration) would always be available at Learning Centers.

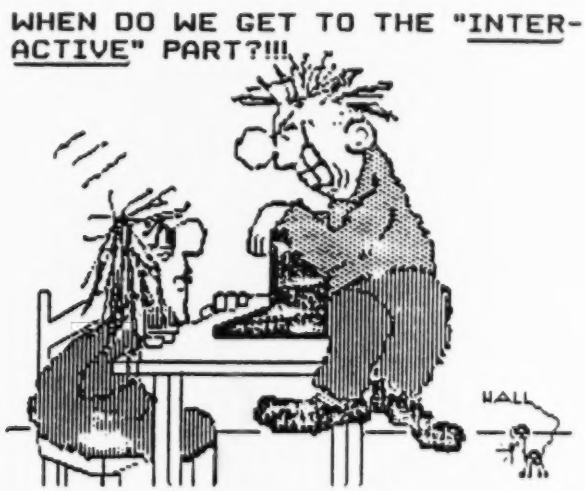
Individualized Instruction: The flexibility of the Interactive-observation Learning Center with its individual personal response and data recording capabilities makes individualized instruction more

feasible (Hart and Staples, 1980; Suppes, 1980; and Weir et al., 1982).

Endless Repetition: The computer is untiring, predictable, never angry, never bored, and controllable. Hence, each trainee is free to progress at a rate most suitable to his/her personal needs (Colby et al., 1981; Sicoli, 1982).

Increased Motivation: Most trainees have been observed to be highly enthusiastic about computer interaction and are eager and able to master its operation in just a few sessions (Chambers & Spencer, 1980; Geoffrion and Goldberg, 1981).

Increased Attention Span: The realism of television, personal interactive capabilities, easy manipulation of materials and creative programming all combine to hold the attention of the trainees (Goldenberg, 1979; Sewell et al., 1979; Bork, 1980; and Geoffrion and Goldenberg, 1981).



More Immediate Feedback: Each individual trainee's data can be kept by computer, with scores from tests and drills automatically recorded and progress (Smith and Sherwood, 1976; Rushby, 1981; and Scioli, 1982). Immediate feedback is also available to the trainee as they watch the video presentation. The computer asks questions about the presentation and provides feedback relative to the correctness of the answers provided by the trainee.

Benefits to the Training Institutions:

More Efficient Inservicing: Interactive-observation will improve the attendance at school inservicing programs. Teachers may find the open availability of Learning Centers more convenient than the typical restricted schedule of the inservice lectures.

Uniformity of Information: Trainees, teaching aides and parents would have access through the Interactive-observation Learning Centers, to answer more specific questions from other trainees, and teachers, etc. who have already completed a course of study. In addition, instructors would have more time to either handle a greater number of students personally, or engage in research and program development.

Better Organization and Control of Training Information: Interactive-observation increases the flow of information in a systematic logical fashion (Fitch, 1985).

A Greater Capacity to Provide Information to Trainees and Teachers: Because an Interactive-observation Learning Center can be established for under $8,000, their availability to almost every school in the nation is assured, and because the copies of the

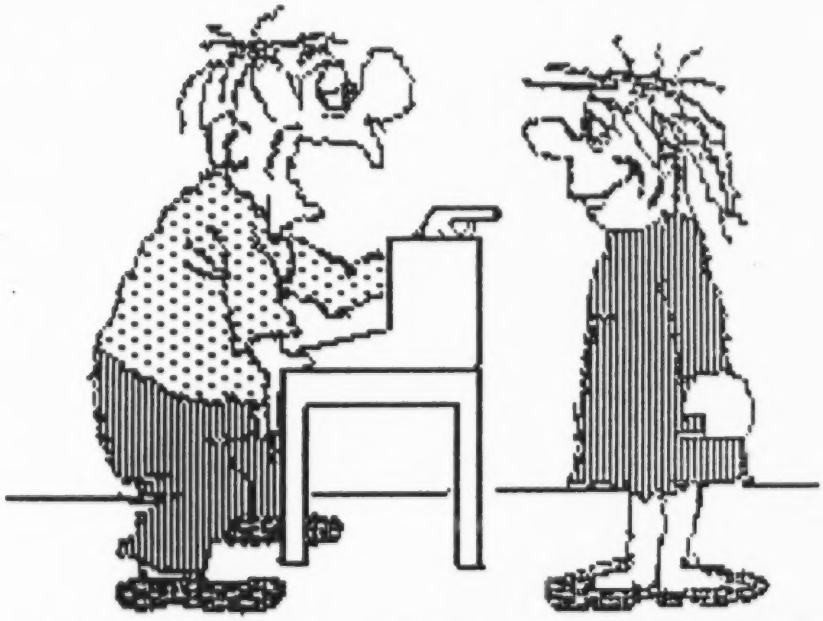
Interactive-observation modules can be obtained for under $10 in many cases, the availability of information, both general and specific to all domains of education is highly feasible.

On the following pages, there is some basic information concerning the equipment necessary to run an Interactive-observation Learning Center, including hardware and software for both the video recorder and video disc setups.

ADDRESSES

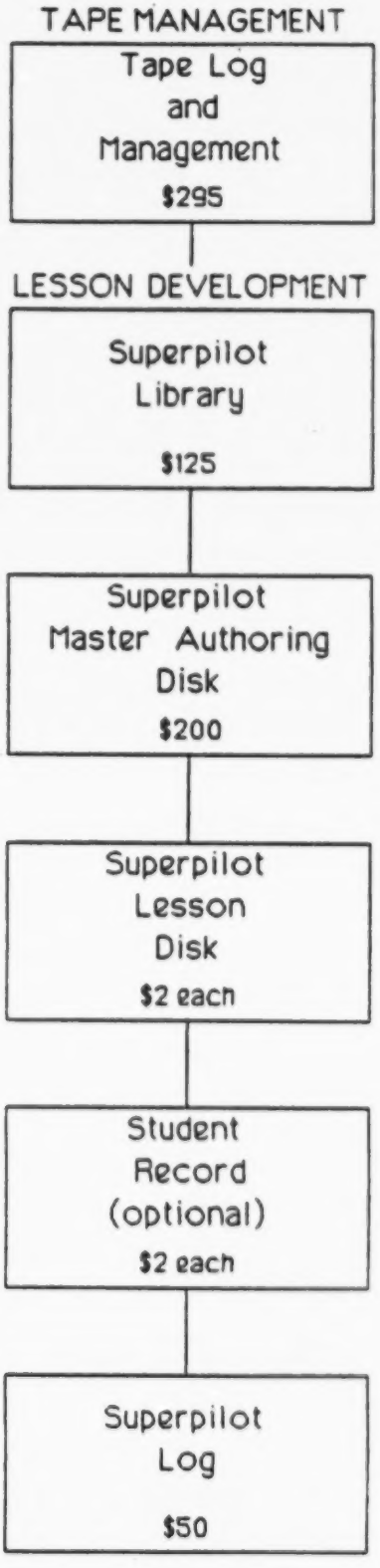
Whitney Educational Services
1777 Borel Place, Suite 416
San Mateo, California 94402
(415) 341-5818

BCD Associates, Inc
Broadway Tech Center
7510 West Broadway
Oklahoma City, Oklahoma 73116
(405) 843-4574
telex. 499-1435



FORGET WHAT IT SEEMS...A CURSOR IS NOT AN ANGRY PROGRAMMER!

INTERACTIVE - VIDEO SOFTWARE



--writes a number (timecode) on each frame of the videotape
--permits user to utilize specific segments of the videotape according to the numbers on the timecode

--bridges the gap between tape management control written in BASIC and the Superpilot Authoring Language written in PASCAL
--copied on to the Master Authoring Disk

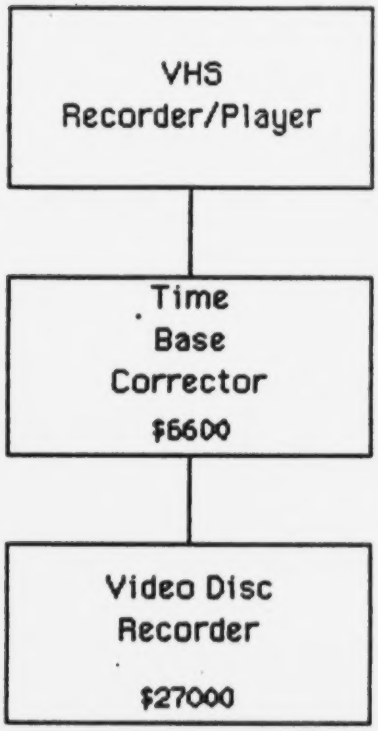
--a 27 command authoring language for preparing computer assisted instruction

--individual lessons written in Superpilot to be used by students in disc drive #1

--optional disk used for storing student scores and other data on or from the lesson disk
--used by the students in disc drive #2

--analyzes student data stored on the record disk or on the lesson disk

VIDEO - DISC HARDWARE

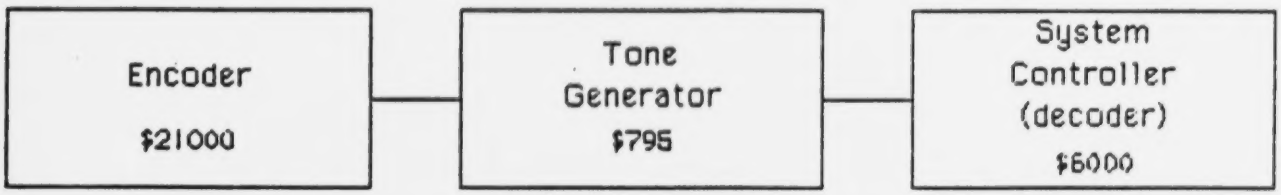


--an editing system that provides a stable timing mechanism to the audio and visual portions of the video tape for transfer to video disc
--necessary to transfer video tape to video disc

--transfers information on vidoe tape to video disc

OPTIONAL ECCO AUDIO ENCODING SYSTEM

The Audio Encoding System enables a signal to be placed on the audio portion of the video disc that will allow up to 40 seconds of audio to be played while visual frame holds for 1 still frame (1/30 second)

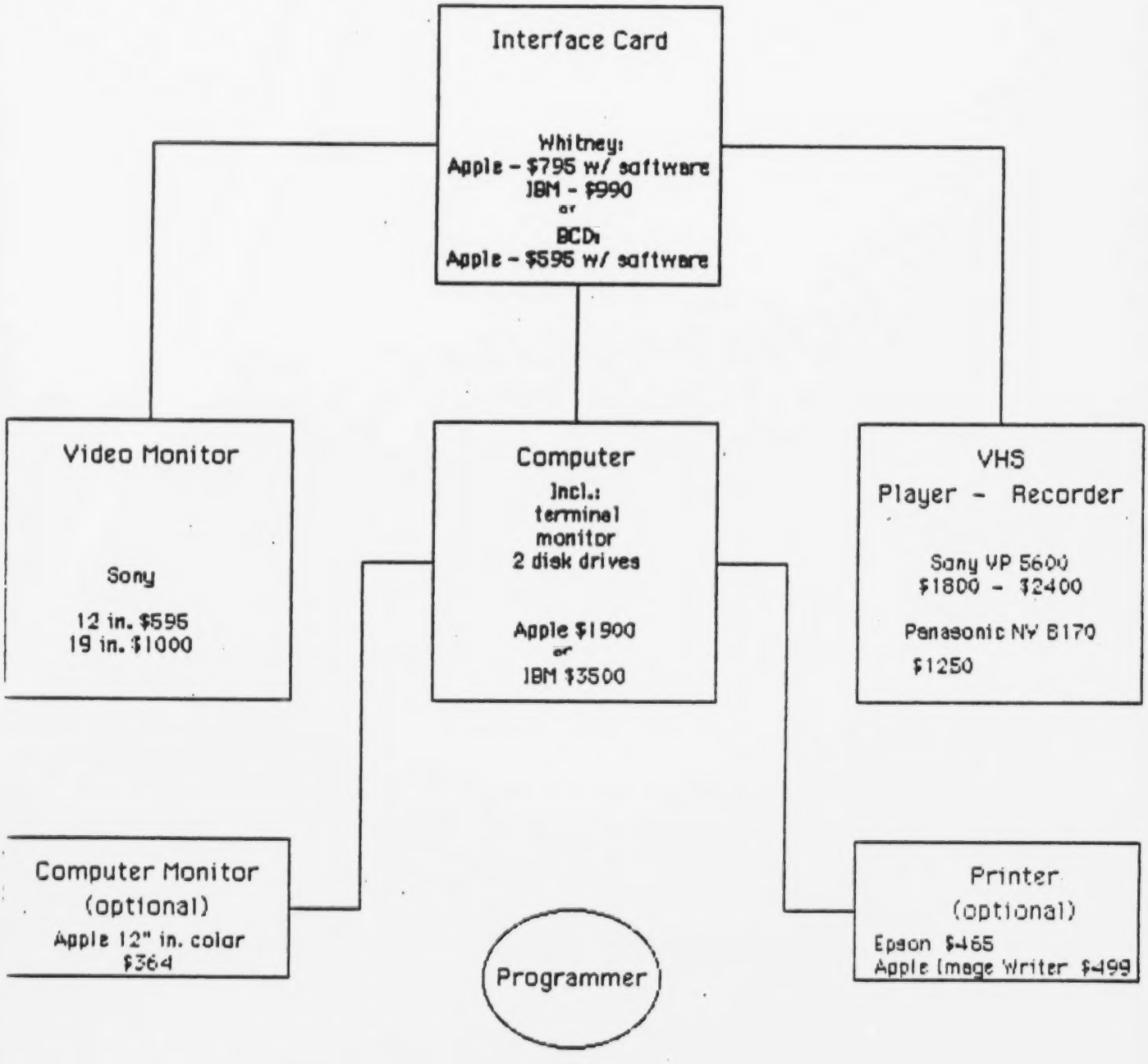


--indicates where on the video disc the signal is to be placed

--generates the tone to engage to audio portion of the video disc while holding one still frame

--decodes the tone and allows the system to move to the apropriate portion of the disc

INTERACTIVE - VIDEO HARDWARE



* Whitney A3001-A Hardware for Apple Computer:
$695 includes Interface Card and Tape/Disc Controller

** BCD Hardware for IBM Computer:
$1200 includes Interface Card and VHS
$1600 includes Interface Card and Videodisc

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